November 27, 1978

Mrs. Carolyn E. Kemp
223 N. Western Avenue
Peoria, Illinois 61604

Dear Mrs. Kemp:

I am sorry to have been so long in responding to your questions but I was away from the lab for the first several weeks of November. You have raised interesting and serious questions, and the response to each would, if complete, be quite lengthy. Therefore, I will only comment briefly on your points. I will try to discuss a few matters which I believe to be important in trying to work out answers, rather than giving you any answers.

A. To my knowledge there has been no rigorous description of the often mentioned possible impact of recombinant DNA experiments on evolution. For example.....it is not clear what species are of concern. Is it the evolution of the bacterial or viral host-vector systems, or the evolution of complex organisms that is of concern? For each type of organisms, different questions arise. Furthermore, there is at present substantial scholarly dispute about mechanisms of evolution for higher organisms, thus confounding the difficulty of analyzing the possible effect of recombinant DNA experiments. Those who have raised the evolutionary argument as a reason for avoiding recombinant DNA experiments have never, to my knowledge, analyzed these sorts of questions.

B. I myself am not competent to discuss gene pools and their evolution. The relative advantages and disadvantages of treating genetic diseases by somatic or genetic approaches has seemed to me a very difficult question. It may well be that we simply have insufficient evidence to deal with this question at present.

C. Yes, I do think that there is now hard evidence that indicates that shotgun experiments using E. coli host-vector systems are not likely to be hazardous. Recall that the initial discussion never said that they would be hazardous, but only that we didn't know and should therefore take an extremely conservative approach. However it is now clear, as documented in the report of the Falmouth meeting of June 1977 and published in the Journal of Infectious Diseases, that the present E. coli host-vector have an extremely low probability of survival outside of the laboratory thus diminishing greatly any concern about shotgun experiments is such systems.

D. I suspect that voluntary control of industrial work in the recombinant DNA field will probably not be sufficient. However, new federal legislation is not the only answer to this problem. There are many individuals who believe that existing authorities, in the FDA, OSHA, and Department of Commerce may provide the framework for meaningful, nonvoluntary control of the private sector.

E. There is accumulating evidence indicating that B. subtilis, and especially the non-spore-forming mutants, provide safe and effective host-vector systems for some recombinant DNA work.

F. I agree with Dr. Zinder's characterization so long as it is restricted to some critics. I do not believe that all the critics fall into this class.

I hope that this has been helpful to you.

Sincerely yours,

Maxine Singer, Ph.D.
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